

THAT WHICH IS CLAIMED:

1. An optical tube assembly comprising:

a tube;

5 at least one optical waveguide, the optical waveguide being disposed in the tube; and

10 a dry insert, the dry insert comprising a tape and at least one filament attached to the tape so that the at least one filament forms a plurality of loops, the dry insert generally surrounding the at least one optical waveguide and coupling the at least optical waveguide with the tube while maintaining an optical attenuation below about 0.3 dB/km.

15 2. The optical tube assembly of claim 1, the dry insert having at least one water-swellable substance for blocking the migration of water along the tube.

20 3. The optical tube assembly of claim 1, the dry insert being compressed by about 10% or more, thereby coupling the at least one optical waveguide with the tube.

4. The optical tube assembly of claim 3, the dry insert having at least one water-swellable substance for blocking the migration of water along the tube.

25 5. The optical tube assembly of claim 1, the dry insert being compressed by about 90% or less, thereby coupling the at least one optical waveguide with the tube.

30 6. The optical tube assembly of claim 1, the at least one filament of the dry insert having a water-swellable component.

7. The optical tube assembly of claim 1, the at least one optical waveguide and the dry insert forming a core, the core

having a pull-out force between about 0.2 N/m and about 5.0 N/m for a 100 meter length.

8. The optical tube assembly of claim 1, the at least one optical waveguide and the dry insert forming a core, the core having a pull-out force between about 1 N/m and about 3 N/m for a 100 meter length.

9. The optical tube assembly of claim 1, the dry insert having the at least one filament attached to the tape so that the uncompressed height of the dry insert is about 5 millimeters or less.

10. The optical tube assembly of claim 1, the dry insert disposed so that the at least one filament is facing towards the at least one optical waveguide.

11. The optical tube assembly of claim 1, the dry insert having the at least one filament on a first side of the tape and a second filament on a second side of the tape.

12. The optical tube assembly of claim 1, the dry insert having a height h that varies across a width w of the dry insert.

13. The optical tube assembly of claim 1, the dry insert having a plurality of filaments that are intermittently attached to the tape.

14. The optical tube assembly of claim 1, the optical tube assembly being a portion of a fiber optic cable.

15. An optical tube assembly comprising:
a tube, the tube having an interior surface;

at least one optical waveguide, the optical waveguide being disposed in the tube; and

a dry insert, the dry insert comprising a tape and at least one filament attached to the tape, thereby forming a plurality of 5 loops with the filament with either the tape or the at least one filament having a water-swellable component, wherein the dry insert is compressed at least 10 percent for coupling the at least optical waveguide to the interior surface of the tube.

10 16. The optical tube assembly of claim 15, the compression of the dry insert being about 90% or less.

17. The optical tube assembly of claim 15, the tape of the dry insert being a foam tape.

15 18. The optical tube assembly of claim 15, the water-swellable component being a water-swellable tape.

19. The optical tube assembly of claim 15, the dry insert having 20 a first type of filament and a second type of filament.

20. The optical tube assembly of claim 15, the at least one optical waveguide and the dry insert forming a core, the core having a pull-out force between about 0.2 N/m and about 5.0 N/m 25 for a 100 meter length.

21. The optical tube assembly of claim 15, the at least one optical waveguide and the dry insert forming a core, the core having a pull-out force between about 1 N/m and about 3 N/m for a 30 100 meter length.

22. The optical tube assembly of claim 15, the dry insert having an uncompressed height of about 5 millimeters or less.

23. The optical tube assembly of claim 15, the dry insert generally surrounding the at least one optical waveguide.

24. The optical tube assembly of claim 15, the at least one filament of the dry insert having a water-swellable component.

25. The optical tube assembly of claim 15, the dry insert being formed from two or more water-swellable components.

10 26. The optical tube assembly of claim 15, the dry insert having a height h that varies across a width w of the dry insert.

15 27. The optical tube assembly of claim 15, the dry insert having a plurality of filaments that are intermittently attached to the tape.

28. The optical tube assembly of claim 15, the optical tube assembly being a portion of a fiber optic cable.

20 29. An optical tube assembly comprising:
a tube, the tube having an interior surface;
at least one optical waveguide, the optical waveguide being disposed in the tube; and
a dry insert, the dry insert comprising a tape and at least 25 one filament attached to the tape to form a plurality of loops, wherein the dry insert and the at least one optical waveguide form a core, the core having a pull-out force between about 0.2 N/m and about 5.0 N/m for a 100 meter length.

30 30. The optical tube assembly of claim 29, the at least one optical waveguide and the dry insert forming a core, the core having a pull-out force between about 1 N/m and about 3 N/m for a 100 meter length.

31. The optical tube assembly of claim 30, the dry insert having at least one water-swellable substance for blocking the migration of water along the tube.

5 32. The optical tube assembly of claim 29, the dry insert having a height h that varies across a width w of the dry insert.

33. The optical tube assembly of claim 29, the compression of the dry insert being about 10% or more.

10 34. The optical tube assembly of claim 29, the compression of the dry insert being about 90% or less.

15 35. The optical tube assembly of claim 29, the dry insert having at least one water-swellable substance for blocking the migration of water along the tube.

36. The optical tube assembly of claim 34, the dry insert having a first type of filament and a second type of filament.

20 37. The optical tube assembly of claim 29, the dry insert having an uncompressed height of about 5 millimeters or less.

25 38. The optical tube assembly of claim 29, the dry insert having a plurality of filaments that are intermittently attached to the tape.

39. The optical tube assembly of claim 29, the optical tube assembly being a portion of a fiber optic cable.

30 40. A method of manufacturing an optical tube assembly comprising:

paying off at least one optical waveguide;

placing a dry insert adjacent to the at least one waveguide, thereby forming a dry core, wherein the dry insert comprises a tape and at least one filament attached to the tape so that the at least one filament forms a plurality of loops; and

5 extruding a tube around the dry core.

41. The method according to claim 40, the method further comprising extruding a cable jacket around the optical tube assembly.

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42. The method according to claim 40, the dry insert having at least one water-swellable substance for blocking the migration of water along the tube.